

CLAIMS

What is claimed is:

- 5 1. An imaging system for sensing a presence of objects near the imaging system, the imaging system comprising:
 a source configured for emitting a stream of radiation;
 a detector configured for detecting a portion of radiation and impacting a detecting face of the detector; and
10 a collision avoidance array disposed on the detecting face of the detector and configured for sensing objects.
- 15 2. The system of claim 1, wherein the collision avoidance array includes:
 a plurality of plates disposed on the array substantially in a plane to form an array of capacitors, each plate configured to sense objects at a corresponding critical distance and configured to generate a corresponding electrical signal;
20 a plurality of conductors extending substantially in the plane and coupled to a multiplexer, each conductor being coupled to a corresponding one of the plurality of plates and configured for conducting the electrical signal to a sensing circuit via the multiplexer.
3. The system of claim 2, wherein the multiplexer is configured to selectively couple the plurality of plates to the sensing circuit.
- 25 4. The system of claim 3, wherein at least one conductor is coupled to ground to provide shielding for at least one of the plurality of conductors.
- 30 5. The system of claim 2, wherein the collision avoidance array further includes at least one shielding conductor extending substantially in the plane and coupled to ground, the shielding conductor configured for providing shielding to at least one of the plurality of conductors.

6. The system of claim 1, further comprising the collision avoidance array disposed on a non-detecting face of the detector.

7. The system of claim 1, further comprising a motor controlling a motion of a gantry, wherein the motor is configured to stop the motion of the gantry when the object is detected.

8. The system of claim 7, further comprising an analysis module coupled to the sensing circuit, the analysis module configured to determine a size of the object detected by the collision avoidance array.

9. The system of claim 8, wherein the analysis module is configured to determine a distance of the object from the collision avoidance array.

10. A collision avoidance system for avoiding collision of a system component with an object, the system comprising:

a collision avoidance array disposed on a face of the system component, the collision avoidance array comprising a plurality of plates configured to detect a presence of objects and generate a corresponding electrical signal;

a multiplexer coupled to the collision avoidance array, the multiplexer configured to selectively activate the plurality of plates; and

a sensing circuit configured to sense the electrical signal and to generate an output signal representative of the presence of the object.

11. The collision avoidance system of claim 10, further comprising an analysis module coupled to the sensing circuit, the analysis module configured to determine a size of the object detected by the collision avoidance array.

12. The system of claim 10, wherein the system component is an X-ray detector.

13. The system of claim 12, wherein the collision avoidance array is disposed on a detecting face of the X-ray detector, the detecting face configured for receiving radiation.

5 14. The system of claim 10, wherein the collision avoidance array is configured to detect the object within a critical distance from the system component.

15. A detection system for detecting a presence of an object, the detection system comprising:

10 a plurality of sensors disposed on a substrate substantially in a plane, each of the plurality of sensors configured for detecting the presence of the object and generating a corresponding electrical signal;

15 a plurality of conductors extending substantially in the plane and coupled to a corresponding one of the plurality of sensors, each conductor configured to transmit the electrical signal when the object is detected.

16. The detection system of claim 15, wherein each of the plurality of sensors is configured for detecting an object at a corresponding critical distance.

20 17. The detection system of claim 16, wherein the critical distance for each one of the plurality of sensors is determined by a corresponding dimension of the sensor.

25 18. The detection system of claim 17, wherein the critical distance is a constant for each one of the plurality of sensors.

19. The detection system of claim 15, wherein the substrate comprises an insulator

30 20. The detection system of claim 15, wherein each of the plurality of sensors comprise a corresponding capacitor sensor.

21. The detection system of claim 15, wherein at least one of the plurality of conductors is coupled to ground to provide shielding for the plurality of conductors.

5 22. The detection system of claim 21, further comprising at least one shielding conductor to provide shielding for at least one of the plurality of conductors.

23. A method for avoiding collision of a system component with an object, the method comprising:

10 detecting a presence of the object within a critical distance from a face of the system component and generating a corresponding electrical signal;
 generating an output signal representative of the presence of the object.

15 24. The method of claim 23, further comprising controlling the system component to prevent collision with the object.

25. The method of claim 23, further comprising determining a size of the object detected.

20 26. The method of claim 23, wherein the system component is an X-ray detector.

25 27. The method of claim 26, wherein the detecting comprises detecting from a detecting face of the detector, wherein the detecting face is configured for receiving radiation from an X-ray source.

28. The method of claim 27, further comprising detecting objects from a non-detecting face of the detector.

30 29. A system for avoiding collision of a system component with an object, the system comprising:

means for detecting a presence of the object within a critical distance from a face of the system component and generating a corresponding electrical signal;

means for generating an output signal representative of the presence of the object.

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30. The system of claim 29, further comprising means for controlling the system component to prevent collision with the object.

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31. The system of claim 29, further comprising, means for determining a size of the object detected.

32. The system of claim 29, wherein the system component is an X-ray detector.

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33. The system of claim 32, wherein the means for detecting comprises means for detecting from a detecting face of the detector, wherein the detecting face is configured for receiving radiation from an X-ray source.